

Technical Overview of the NIBIN Network

ATF is deploying Integrated Ballistics Identification System (IBIS) units to State and local law enforcement agencies. These units, which are connected together into the National Integrated Ballistic Information Network (NIBIN), allow firearms technicians to acquire, digitize, and compare markings made by a firearm on bullets and cartridge casings. By minimizing the amount of non-matching evidence that firearms examiners must inspect in order to discover a match, the NIBIN system enables law enforcement agencies to discover links between crimes more quickly, and to discover links that would have been lost without the technology.

Equipment and Networking

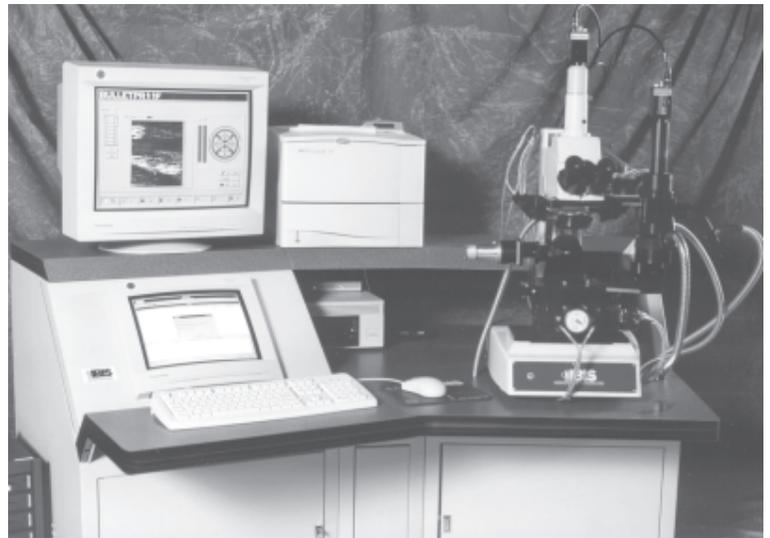
Four different types of IBIS equipment comprise the NIBIN network; all are manufactured by Forensic Technology, Inc. The different types of machines and their functions are listed below:

- **Regional Server:** The central data repository for the region, where all images are stored and bullet/cartridge casing correlation requests are executed.
- **DAS Remote:** IBIS system comprised of a microscope and a computer unit which will allow for either acquisition or image evaluation. DAS Remotes are linked via local area network to a Regional Server, where the images are stored and bullet/cartridge casing correlation requests are sent.
- **RBI:** A totally portable cartridge casing system which permits the on-site capture of fired cartridge casings for immediate transmission to a central IBIS location for processing and comparison. RBIs can also be issued to jurisdictions with ballistic imaging needs but without their own firearms examiners; in this case, the agency with the RBI must reach

a partnership with a nearby agency with DAS Remote equipment in order for match verification to take place.

- **Matchpoint:** A desktop computer connected via Local Area Network to a DAS Remote, serving as an additional workspace for the analysis of images.

NIBIN units were initially deployed in a “hub” configuration, under which a typical region would receive one hub unit and several Data Acquisition Station Remotes (DAS Remotes), linked through a local area network. The hub unit, located in a forensic science laboratory serving a metropolitan area or region, was comprised of a Data Acquisition Station (for generat-



The DAS Remote is used to acquire images and to analyze search results.

ing images), a Signature Analysis Station (for comparing images), and a database correlation server. Under this configuration, one hub unit server handled the data from several acquisition stations and housed the database for the region.

As the nationwide rollout was planned, it became apparent that enabling correlation of data from more jurisdictions would make the network much more effective. A Regional Server with enhanced capabilities for storing data and managing correlations was then developed. Under this configuration, a large number of sites (all the sites in a state, or even in a multi-state region) can store information in the same server and share information quickly and easily as a result. The reconfiguration both increased the functionality of the system and decreased its price, as fewer servers were required to store the nation's data.

In order to operate effectively, the IBIS units are networked together as the equipment is deployed. The decision was made to handle the first two regions of deployment (California-Nevada, Texas-Oklahoma) by a frame relay network funded by ATF, and to network the third (Florida-Puerto Rico) via the FBI's CJIS network.

Data Entry and Correlation

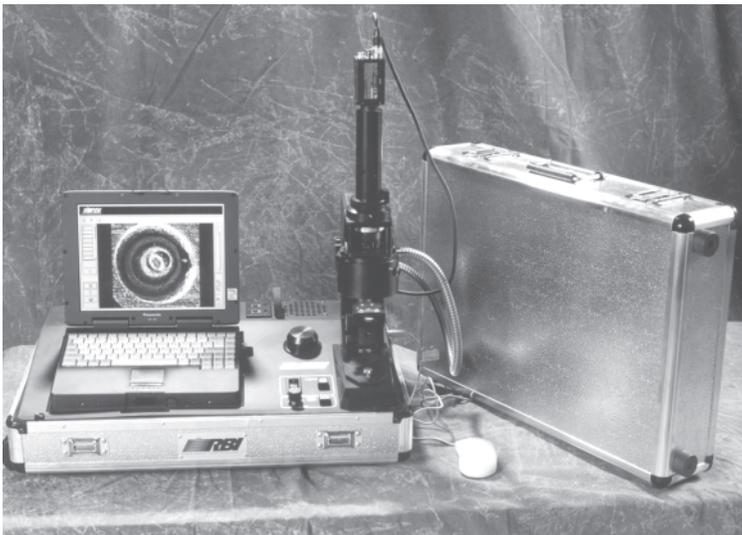
IBIS technology was designed for operation by a firearms examiner or technician, with or without extensive previous experience in using a computer. A firearms examiner or a technician may be trained to enter the markings from crime scene bullets and casings. In addition to demographic information such as crime date and other information, each record contains images of the bullet or cartridge casing. For a cartridge casing, images correlated include the breech face, firing pin, and ejector, if present; a sidelight image may also be viewed. For a bullet, images of the bullet's lands are stored. For an average user, it takes about 5 minutes to complete entry of a cartridge casing, and 12 minutes to enter a bullet.

If the image has been captured at a DAS Remote, the data is then sent from the DAS Remote to the Regional Server for storage and correlation against other images in the regional database. Correlation results, a selection of images with very high correlation scores, are then sent back to the DAS Remote.

Images captured by an RBI are sent by telephone line to the cooperating DAS Remote. After a quality review, the images are transmitted to the Regional Server for comparison against other items in the regional database. Correlation results for the request are then sent back to the cooperating DAS for examiner evaluation, and the agency possessing the RBI is telephoned with the results.

The IBIS comparison analysis system does not positively match bullets or casings fired from the same weapon; this must be done by a firearms examiner. The system does, however, produce a short list of candidates for the match. When an image looks as though a match could exist, the firearms examiner examines specimens on a comparison microscope. Matches are found in the first five breech face, firing pin, and/or ejector images evaluated approximately 97% of the time, yielding a dramatic time savings for an agency's firearms examiners. Automated searches complete ballistic comparison analyses with efficiency never before seen.

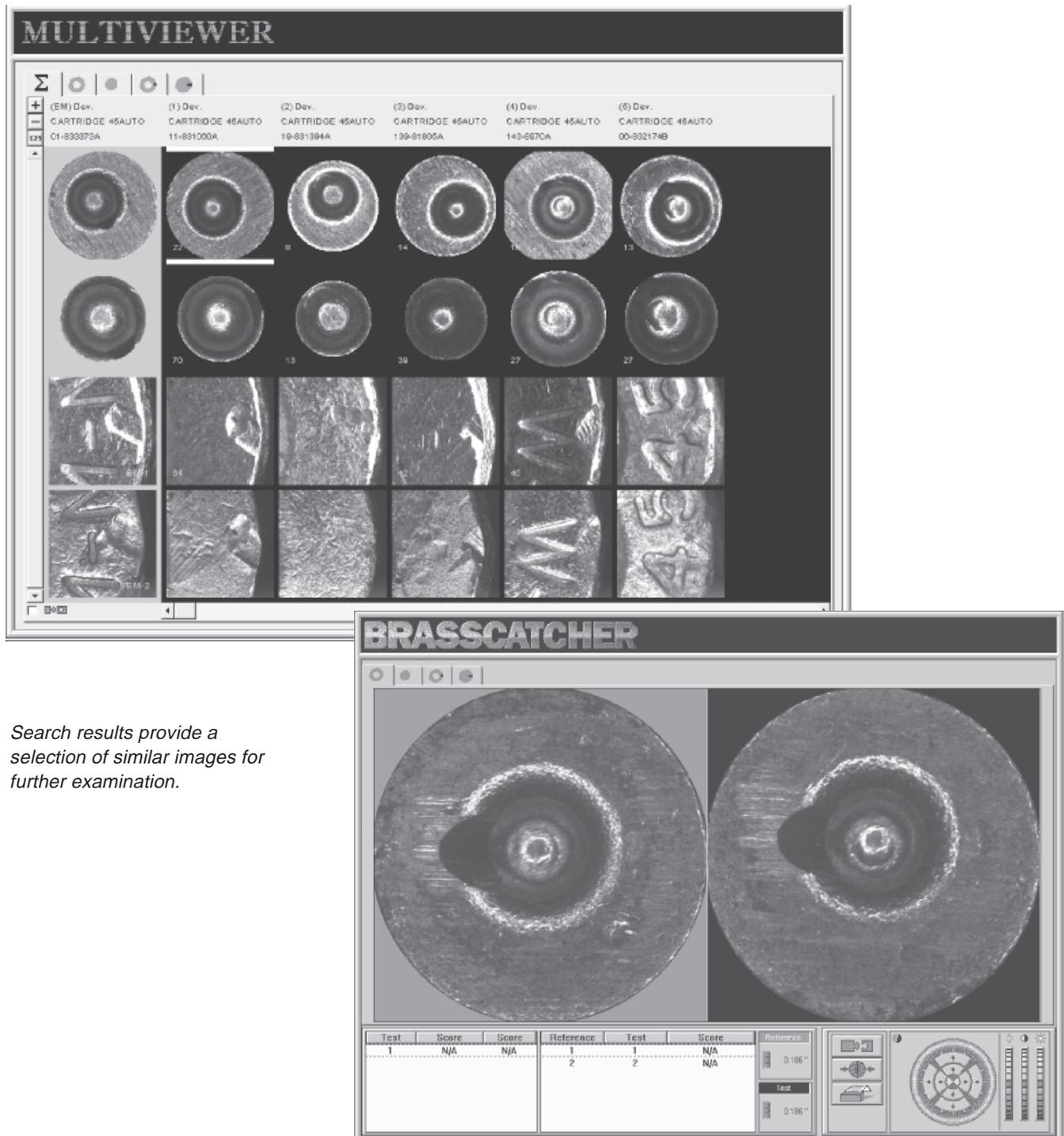
The forensic ballistic examination provides prosecutors with the best possible evidence to link a particular firearm to a specific crime. For example, a fire-



The RBI can acquire images at the scene of a crime.

arms examiner using IBIS technology can compare, analyze, and positively match a bullet recovered at a violent crime scene to a firearm found in the possession of a possible suspect. In the case of the Rapid Brass Identification units, ejected cartridge casings found at a crime scene can be digitized right at the scene. The signature information can then be transmitted to a laboratory where a technician can use the

system to conduct a search. If a match is found, results can be returned to the personnel on scene while the investigation is still recent. Such information will often also serve to provide new information on an unsolved case. In such circumstances, one IBIS match can provide leads useful in solving more than one violent crime.



Search results provide a selection of similar images for further examination.